International Correspondence Schools
Scranton, Pa.

Patternmaking Equipment and Operations

PREPARED ESPECIALLY FOR HOME STUDY

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2332 A PART 1 EDITION 1

PATTERNMAKING EQUIPMENT AND OPERATIONS

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PATTERNMAKING TOOLS

BENCHES AND BENCH EQUIPMENT

1. Bench Work.—Woodwork done at a bench by the use of hand tools is usually called bench work. The work to be done is first laid out by making measurements and drawing lines on the pieces of wood; the parts are then shaped to the required form and fastened together.

2. Patternmakers' Benches.—A number of varieties of patternmakers' benches are now in use. The type shown in Fig. 1 is one of the most simple and serviceable. The top is made about 2 feet 8 inches wide and about 8 feet long, being built up of 2″×4″ birch, set on edge and glued and then bolted together. The legs are made of cast iron. The work is held in a vise *a*. A strip of wood or leather *b* about $\frac{3}{8}$ inch thick forms a convenient support for tools such as knives and planers, keeping them from resting on their cutting edges when not in use. Other tools may be kept in a large drawer *c*, about 6 in.×24 in.×16 in., and a smaller drawer *d*, about 3 in.×15 in.×8 in., provides a separate place for screws, nails, and other supplies. At the extreme right corner of the bench is another vise *e*.

3. Vises.—Vises are used to hold the material while the work is being done. They should be so constructed that the piece can be readily released or gripped. They should also

hold the work firmly when closed, as any movement of the work might cause it to be spoiled. The jaws should be parallel in all positions in order that they may have a good bearing upon the piece. An enlarged view of the vise *e*, Fig. 1, is

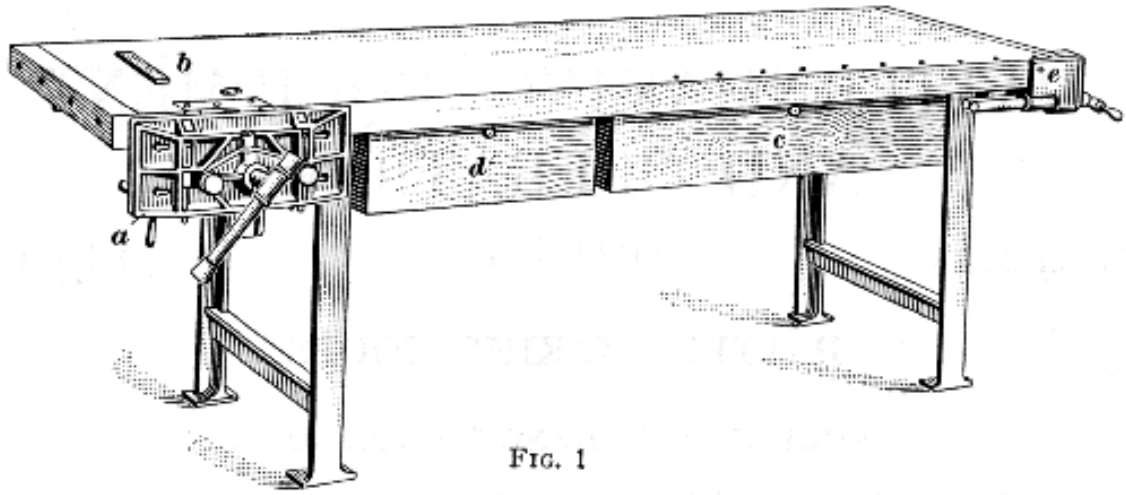

FIG. 1

shown in Fig. 2. The inner jaw *a* is attached to the bench and carries a fixed bronze nut in which the screw *b* rotates. The screw, which has a double buttress thread, controls the outer jaw *c* and is turned by means of the handle *d*, which passes through a sleeve on the end of the screw, as shown. Two guide rods *e*, passing through the bearings on the rear

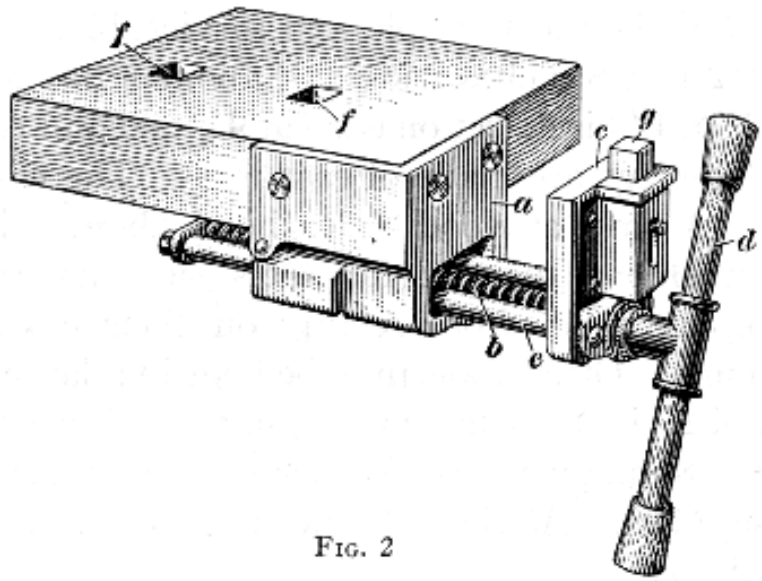

FIG. 2

jaw, assist the screw in holding the two jaws parallel. The jaws are made of cast iron and may be faced with wood or leather, the facings being so attached that they can be easily renewed when they become worn. For holding large work

the bench is provided with a row of square holes f in which wooden stops may be placed to keep the piece from slipping. A stop g, adjustable for height, is used to clamp a long piece against a stop in one of the holes f.

4. The vise a, Fig. 1, is known as a universal vise. One form of universal vise, which is shown in horizontal and

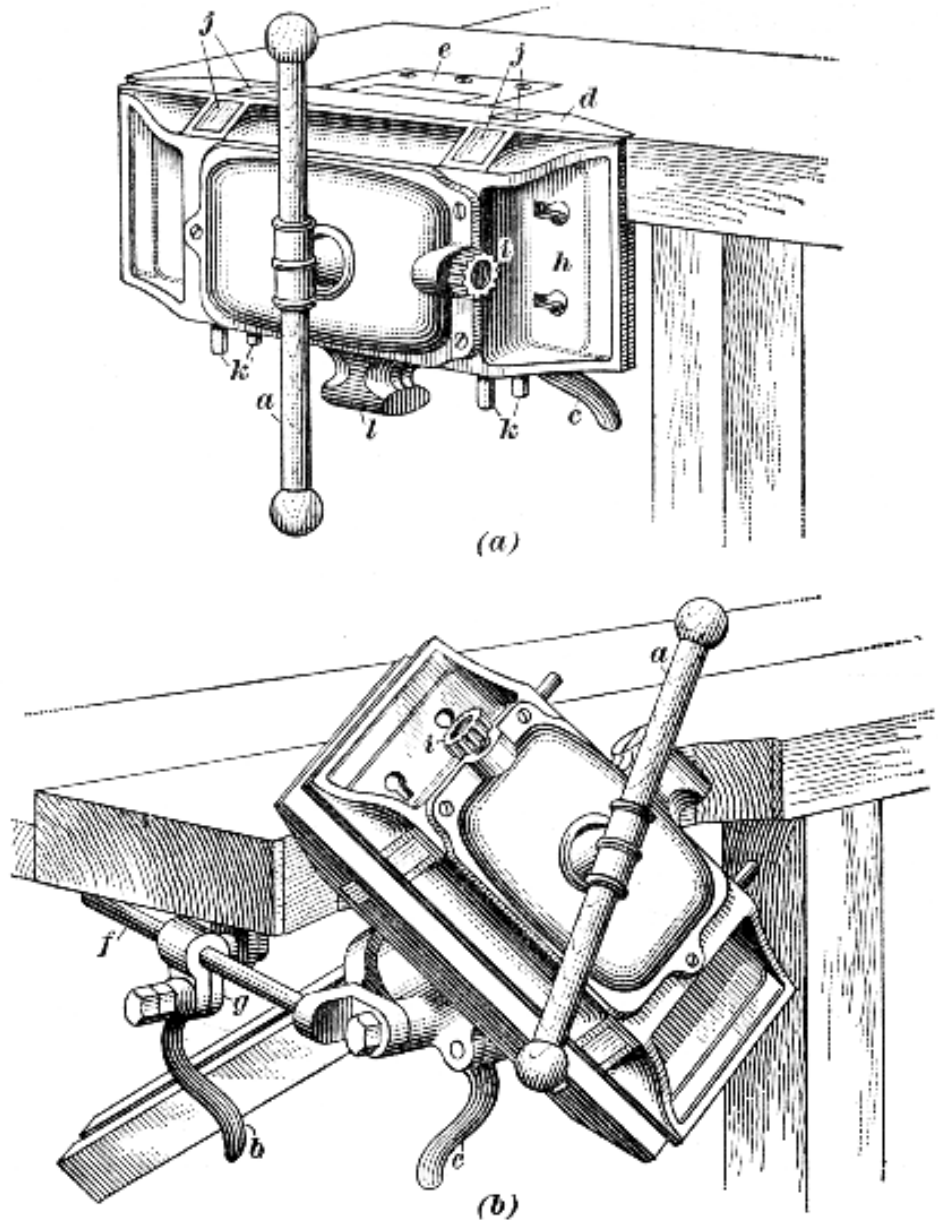

FIG. 3

inclined positions in Fig. 3 (a) and (b), is particularly useful because of the many positions in which it may be placed. The jaws of the vise are opened and closed by means of the handle a, which turns a screw that passes through the jaws inside a square, hollow bar. This square bar keeps the jaws

in their correct relative positions. The levers b and c are used to clamp or release the vise when it is to be held or swung to a desired position. The back jaw d is swiveled on a disk that is hinged to the plate e on the top of the bench. To swing the vise from the horizontal position to the vertical, the lever c is moved, thus pulling out a pin that passes through the disk into a corresponding hole in the back jaw. The vise is then swung to the vertical position, the lever c is released, and a spring moves the pin into the back jaw again, holding the vise firmly. To put the vise in an inclined position with respect to the top of the table, the lever b is moved, releasing the rod f. The vise can then be swung upwards on the hinge by which it is held to the plate e, until it has the required inclination. The rod f meanwhile slides freely in the block g and when the vise reaches the desired position the lever b is moved back and the vise is held firmly in position. The front jaw h of the vise can be moved slightly out of parallel with the back jaw by turning the thumbscrew i. The pins j, two in each jaw, may be raised above the jaws by striking against their lower ends k. They are used to hold curved pieces that could not well be held between the main jaws. The pair of small jaws shown at l may be brought into position by turning the main vise halfway around from the position shown in (a).

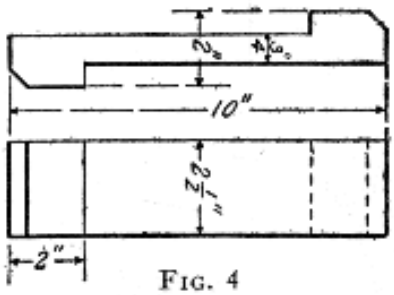

FIG. 4

5. Bench Hook.—A very useful accessory to the work bench is the bench hook shown in Fig. 4. This hook forms a movable stop that can be used at right angles to the front face of the bench to support the work when sawing or chiseling. When it is desired to saw off a piece of stock, the bench hook is placed on the bench, one shoulder being set against the edge of the bench, while the upper shoulder serves as a stop against which the stock is held when sawing. Care must be taken not to saw into the bench. When chiseling, the work may be held against the hook in the same way as when sawing.